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# SYNCHRO 'SETTE



THE SUBSCRIPTION MAGAZINE FOR  
THE T/S-1000 and THE ZX-81 MICROCOMPUTERS

# SYNCHRO-SETTE

The Subscription Magazine For  
The Timex-Sinclair 1000 Microcomputer



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## THIS MONTH'S PROGRAMS



There are 8 programs on this month's cassette.

Each program is recorded only once on each side of the cassette. The first 4 programs that can be LOADED are 2K in size followed by 4 - 16K programs. The other side of the cassette is a duplicate of the first side.

The minimum configuration to load any of the programs is 2K of memory for the first 4 programs and the LOADER program. None of the programs will load into a 1K 2X-81.

Many of the 2K programs seem to work better with the 16K rampack removed from the TS/1000.

For you new subscribers who aren't familiar with LOADING procedures for cassette programs, follow the following directions:

A - Make sure that the volume setting of the recorder is set at about 80 % maximum.

B - If you have a Bass and/or Treble control on the recorder, make sure the Treble is at maximum and the Bass is at minimum.

C - To LOAD the first program, type in LOAD \*\* and press the ENTER key on the computer. Then press the PLAY button of the recorder. The lead time on the DEC/B2 cassette is 20 seconds until the first program begins.

The time needed to load the loader program is 29 seconds. When the program is loaded, the screen

will first go blank and then a list of this month's programs will appear. All programs on this month's cassette are self-running.

Shut off the recorder when the loader program is loaded. Any of the listed programs can now be loaded into the computer by pressing the appropriate number on the keyboard and pressing the PLAY key on the recorder. The loader program loads the program by searching for the name of the program you want and ignoring any of the other programs it may encounter along the way.

If you want to go directly to a program without waiting, we suggest you first find the tape location of the beginning of each of the programs with your recorder counter. This can be done as you go through the programs the first time, noting the tape location on the counter as each one is being loaded.

If you don't have a counter, approximate the tape position with the fast forward key just before where the program would start and then LOAD the program with the name of the program using the format LOAD "NAME OF PROGRAM".

Some of our subscribers have told us that they could not get the programs to load by name but they would load with the double quotes. Others have told us that the loader program wouldn't load certain programs. Most have told us that all the programs could be loaded either way. Every customer's cassette is made from the same master tape so the programs on everyone's cassettes

are identical. We feel it is most probably a problem of volume adjustment.

PROGRAMS (all self running  
program's names have an inverse  
last character /RT = run  
time/LT = load time)

### 1 - "SEASONS GREETINGS" 2K/LT= :22

We hope this program isn't dated by the time you get it.

### 2 - "MILEAGE" 2K/LT= :27

This program is designed to provide you with statistical information regarding the mileage of your vehicle. To get this information you need the following:

A - The odometer reading at the time  
of the fill-up previous to the last fill-up

B - The odometer reading at the time  
of the last fill-up

C - How many gallons the tank of the  
vehicle holds

D - How much did it cost for the last  
fill-up (item B)

E - What was the price per gallon

After this information is entered, the screen will display all of the pertinent data.

### 3 - "CHAINSAW" LT= :28

A portion of a moving chainsaw blade will be displayed. The numbers and letters on the teeth represent the hexadecimal numbers from 0 to 15. The graphic symbol will shoot a projectile at a 45 degree angle when the (Z) key is depressed. The player is allowed 10 shots.

After the first shot is made, the projectile will hit either 0 or 2 of the teeth. If 2 teeth are hit, the

appropriate amount will be added to the score and the top set of teeth will move one tooth position to the left in relation to the bottom set of teeth.

This, of course, means that the next shot can only net one tooth. One of the top teeth must be hit in order to get the sets aligned again.

Try to hit all of the lettered teeth as this will net you the highest score.

### 4 - "FRENZY" LT= :31

This game does crazy things to your screen. The character and graphics generator of your computer will seem to have gone haywire about 2 thirds of the time as the screen quickly changes from one graphics mode to another.

When the screen clears to the point of being legible, you will notice a squot that moves in a box from right to left a random amount of spaces from its starting point on the left and then returns. You will also notice that the word (NOW) every now and then appears in the upper right hand corner of the box.

The squot can move as many as 10 positions from its starting point. If the word (NOW) appears and you press the (Z) key, your score will increase one point for as many positions the squot is to the right of its starting point.

If the word (NOW) does not appear and you press the (Z) key, you will receive no points.

You are allowed 10 tries. The upper lefthand corner of the box will display after the first try, the letter (A) followed by a number. This number represents the amount of tries you have used.

The lower left corner displays the letter (C) followed by a number. This number represents the amount of spaces that the squot will travel to



the right from the starting position on this cycle.

The lower right corner will display the letter (B) followed by a number which represents your current score.

If you press the break key while the screen is in a state of - FRENZY - you may not be able to return with the CONT key. All attempts to LIST or RUN the program may prove unsuccessful as the screen is filled with trash. The only way to return the screen to normal will be by turning the computer off and then on again.

#### 5 - "INVENTORY" LT= 2:46

The most asked for program by our subscribers. It took me about 20 hours to write this one and I hope you like it. The user is cautioned to not input numbers that exceed the limits of the program's design:

ITEM -	8 Character max.
PART # -	6 Character max.
UNIT COST	999.99 max.
ITEMS/UNIT	9999 max.
UNITS IN STK	9999 max.

To start the program, go to prompt (1). The program will cycle, asking information about each inventory item. The first item is asked to be described by either name or description. Up to 100 inventory items can be entered. If more or less are needed, change the number 100 in line 10 to whatever amount you need within the computer's memory capability. The higher the number, the slower the program will operate.

\*\* If no information is typed in for the item, the program will return to the menu.

Then the part number can be inputted followed by the unit cost. If the unit is a package that includes more than one component, enter the cost for the whole package. It is important to add the trailing zeros, if the entry is less

than 3 characters including the decimal point.

Prompt #2 from the main menu will be the one used the most. A secondary menu is displayed where the user is given the choice of 4 prompts:

- 1 - SEE TOTAL INVENTORY
- 2 - CHANGE INVENTORY
- 3 - SEE ITEM DATA
- 4 - EDIT DATA

#1 displays all the inventory items by scrolling the data an item at a time. IT/UN stands for items per unit and IN/S stands for how many in stock.

#2 allows the user to add or subtract to any inventory item.

#3 displays the pertinent information of any item/unit.

#4 allows the user to edit any of the information of a stock unit except the inventory amount, such as the name, stock #, cost or items/unit.

The main menu prompt #3 allows the user to save the file on cassette. The FILE NAME that is asked for will be the name used when you want to retrieve the file at a later time.

The main menu prompt #4 allows the user to clear all the data from the program and start from scratch. A good time to do this would be if one file is complete and saved and another is to be created.

#### 6 - "SPACE DOCKING" LT= 1:19/written by Ken Duda

You are in charge of Robot Ships that are too small to take on enough fuel to get away from the planet's gravitational pull to make it to their destination.

As a result, they must take on added fuel from satellites launched from a main satellite station in orbit around the planet. You must

guide them carefully. If you don't dock directly under the satellite, your ship will not be able to complete the fueling operation and its orbit will decay and it will be pulled back to the planet and crash.

Each time you succeed in reaching the outermost part of the galaxy, the message <SAVED> will show at the top of the screen and points will be added to your score which is shown at the bottom left of the screen.

The game ends with the messages <SHIPS SAVED = > and the total point score. 18 ships saved is about average and points are scored on a random basis.

7 - "QUOTE" LT= 1:40

Ever had to estimate how much it would cost to do some work for someone? Ever wonder how a company gives you a price to do work for you such as putting storm & screen windows on your home or work on your car?

The methods for achieving a price quote are similar to the ones used in this program.

The program starts by prompting you for the JOB NAME. This can be the customer's name (28 characters max.). Try the program with the sample entry JOHN DOE.

The prompt NUMBER OF INSTALLATIONS appears. Let us say in our example that JOHN DOE had 3 lawns he wanted landscaped that are in a townhouse complex that are all identical in size, so we would enter <3> here.

ARE MATERIAL COSTS TO BE ITEMIZED (Y/N)? In most quotes, the materials are itemized. However, if the same type of materials are used over and over again where only the labor is different, the materials need not be itemized and the answer to this prompt would be <N>. For our example, we will answer <Y>.

We are shown the prompt ITEM? ENTER the first material item which we shall call SOD.

The prompt COST appears. ENTER 245. You will notice that each item entered is displayed on the screen but numeric amounts will not have the trailing <0>s.

The prompt <QUANTITY> asks you how many sets or packages of SOD are needed. The price of 245.00 represents the cost of SOD for each lawn so the number <1> would be entered.

The following format is displayed:

ITEM	COST	QUANT	EXTEND
SOD	245	1	245

The next ITEM to be entered is FERT for fertilizer (8 char. max) which costs 1.98 per bag. The QUANTITY is 27 bags for each lawn. Now the displayed format shows:

ITEM	COST	QUANT	EXTEND
FERT	1.98	27	53.46

You will notice that the EXTEND column shows the extended amount for that material item which multiplies the COST times the QUANTITY.

We have no more materials to enter at this point so for the ITEM prompt we just press ENTER.

The total material cost is now displayed. We now will move on and start entering the labor costs. Press ENTER.

Before we continue, it would be a good idea to explain that the labor is divided into two areas, SHOP LABOR and OUTSIDE LABOR. I purposely used and example where we could see both. If one or the other is not used, do not itemize that area and ENTER <0> for the total labor amount in that area when asked.

ENTER (Y) for this prompt.

The prompt ITEM in this mode can be the employee's name or employee



number. ENTER (S. JONES). Let us say that Sam Jones makes 5.00 per hour. ENTER (5) for the COST prompt. Let us say that it takes Sam 7 hours and 15 minutes to cut and prepare the SOD from your sodfarm. This figure must be converted to its decimal equivalent. The QUANTITY prompt is asking for how many hours Sam will work. ENTER (7.25).

Again, the format is displayed. Notice that the (5) in the COST column immediately follows the name (S. JONES). It would be a good idea to shorten the ITEM name to a maximum of 7 characters. In this example, the period could have been eliminated.

George Peters is going to load the sod and fertilizer on the trucks. He gets paid 4.50 an hour and it will take him 2 hours and 20 minutes to do it. ENTER the appropriate data for George.

George is the last employee to perform shop labor so for the next item prompt, just press ENTER.

The totals for SHOP LABOR are now displayed.

#### ON SITE LABOR TO BE ITEMIZED?

ENTER (Y). Sam Smith, an employee of ours, has a specialty of laying the SOD. ENTER his name for the ITEM prompt. He gets 5.00 per hour and it will take him 5 1/2 hours to do the job.

Tom Thumb, another employee of ours, is an expert at fertilizing the lawns and we pay him a wage of 4.25 an hour for his services and it will take him about 2 hours and 15 minutes to complete his work. ENTER the appropriate data.

Since there are no more employees in this area, press ENTER for the ITEM prompt and the totaled data will be displayed. Press ENTER again to move to the next part of the program.

OVERHEAD - (% OF DIR LABOR)

This prompt asks you how much more, percentagewise you want to charge your customer for labor. In other words, do you want to mark your labor up 50%, 100%, 200% or what?

ENTER (50). Now the prompt PROFIT (% OF JOB COST) appears. This prompt asks you - of the total costs incurred so far including the mark-up for labor costs, what would be the percentage you want added to that sub-total for your profit margin?

ENTER (40) and then press (ENTER) to see the job quote.

Analyze the data displayed on the screen. The COST items can be totalled by hand (or you could write a routine - we don't want to make it too easy for you) and subtracted from the the JOB QUOTE estimate to show your total profit.

8 - "BULLETIN" LT= 2:15  
RUN TIME = 10:13

Our Bulletin Board program for this month has an interesting feature which is the capability to stop the message scroll by pressing any key but BREAK while the message is scrolling. The message will stop for about 2 seconds. If the key is kept depressed, the message will scroll 1 character at a time every 2 seconds.

P.S. The 16K rampacks from MEDIA are 46.00 not 44.00.



If an egg cracks while hard-cooking, immediately pour a generous amount of salt on the crack. It tends to seal the crack, containing the egg white within the shell.



## \* HISTORY \*

### THE BIRTH OF COMPUTERS

In last month's issue, we discussed the role Lady Ada Lovelace played as the first woman in computers while working with the pioneer Charles Babbage.

Mr. Babbage is generally given credit as being the first person to design a device that could perform mathematical operations that put the device in a class as being the first computer. This device was called the Analytical Engine.

Although Mr. Babbage designed the device, he never actually built it - only the calculating device to be used on the finished model, which worked perfectly. Lack of funding from outside sources and his government was the main reason for this. The analytical engine as designed, could feed acquired information back into itself to perpetuate formulation thus bringing about the first true computing machine.

The machine displayed in many text articles was actually a device called the Difference Engine. This machine was a system of gears & cogs that was used to calculate the results of basic mathematical formulae.

An example of a problem that could be fed into it was to find the

difference between the squares of consecutive numbers:

X	X sq	1st dif	2nd dif
1	1	-	-
2	4	3	-
3	9	5	2
4	16	7	2
5	25	9	2

This type of data can be calculated with the combination of today's pocket calculators and a paper & pencil. One of today's programmable calculators could figure the answers without the pencil & paper.

Although a few people used Babbage's ideas, credit for the first machine developed for practical purposes and that went into actual production using Babbage's ideas went to George Scheutz who displayed his version of the Difference Engine at an Engineering Exhibition in 1855. Babbage himself was present and although disheartened, was congratulatory to the effort.

When he died in 1871 at the age of 88, he was probably most disappointed that he never had completed the Analytical Engine that had been his life's work and inspiration.



Babbage's son, Henry, finally made a working model of his father's Analytical Engine and on January 21st, 1888, was able to demonstrate its capabilities by producing a printed table of the multiples of P1 to 39 places. The demonstration was not a complete success, as the 22nd multiple was in error. It took him 18 years to figure out the bug. By that time the engine had been donated to the South Kensington museum.

In the 1880s, one of the prime problems of existing government was census taking. With growth shifting from Europe to the United States, a new method had to be devised to obtain population data. The solution was to hold a competition. The U.S. Congress, realizing that the industrialized world was becoming so complex, offered a government contract for the best method of accumulating population data. The competition was fierce and fast but it finally narrowed down to three entrants. Mr. William C. Hunt's method used colored cards. Mr. Charles F. Pidgin had color coded tokens and Mr. Herman Hollerith used his tabulating machine.

The contest was settled by a practical test in St. Louis, Missouri; and Mr. Hunt's cards took 55 hours and Mr. Pidgin's tokens took 44 hours.

Despite much criticism, Mr. Hollerith's machine took only 5 1/2 hours. The skeptics were routed and the machine was selected for the 1890 census. Censuses were taken every 10 years and the previous one had taken almost 10 years. Six weeks after the machine began its job, the United States population was announced at 62,622,250.

Needless to say, a new age had dawned. Governments and businesses stood in line to utilize the services of Mr. Hollerith's new company, The Tabulating Machine Company in Washington, D.C.

Some of the first customers were the railways and the Czarist

government of Russia. The company grew steadily and in 1911 merged with other time-recording businesses to form a conglomerate known as the Computing, Tabulating and Recording Company. Hollerith worked with the company as a consultant till his death in 1929 at the age of 69.

Today that company is known as IBM.

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A computer can read  
printed characters by  
using light-sensitive devices

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#### EDITOR RAMELINGS CONT.

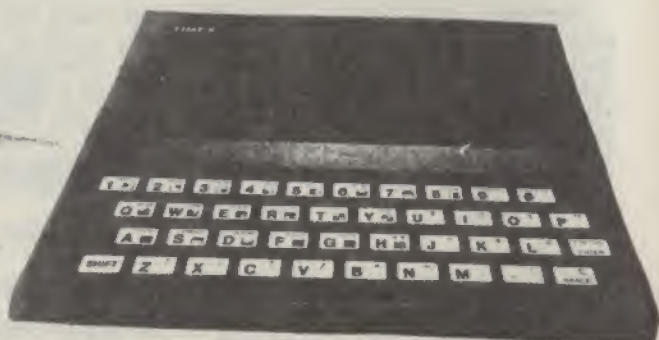
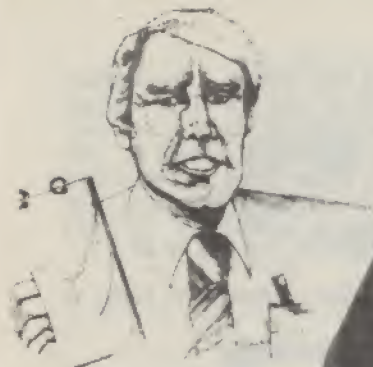
Want to have your computer control machines, monitor temperatures, run a model train or even operate electric devices that previously needed human supervision and do it with programs that you write in BASIC?

Then contact Thurnall Electronics. Send a S.A.S.E. for their free catalogue of interface devices, switching units and joysticks. There are too many items to list, but all of the ones I saw sold for under \$30. For further information contact:

Thurnall Electronics Eng.  
Dept Y, 95 Liverpool Rd.  
Cadshead, Manchester  
M30-580 England  
TEL 061-775-4461 (24 hr)

Ed. note - A subscriber told me that he received a shipment from an English Company (I don't remember which one) in 10 days. This might be something to keep in mind when ordering.

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## EDITOR RAMBLINGS

### MISTAKES IN THE 11/82 ISSUE

Once again we have to apologize. On page 20 in the HAPPY HOLIDAYS program, line 1028 should read:

1028 UNPLOT RND\*62, RND\*43

In the DATES program line 260 should read:

260 LET Z=24\*23-22\*21+0-1

### SINCLAIR POCKET TV

As of this writing, it is rumored that Sony is already marketing their flat screen pocket TV, the Sony Watchman, in the U.S. Although I haven't spoke to anyone that has actually seen one other than at the C.E.S. shows, a marketing representative informed me that they have been released for sale. The retail price of the Watchman is supposed to be around \$300. It has already been selling in Japan for the equivalent of 240 American dollars.

A major marketing company is gearing up to stick a pin in Sony's balloon by marketing the Sinclair pocket TV for the projected price of 99.95. After talking to a reliable source, we were told to expect a major mail order marketing campaign to start sometime during the first

month of 83.

Many financial analysts believe there is no market for pocket TVs in the U.S and at a retail price of \$240, I tend to agree with them. The same analysts probably couldn't foresee the impact the ZX-81s and T/S-1000 made.

Although the tube of the Sinclair TV is tiny, only 2 by 4 inches and 3/4 inch thick, it is 3 times brighter than a conventional 3 inch CRT.

The potential for use as a computer screen display opens an entirely new frontier. Unlike the Osborne and Kaypro models of portable computers, a pocket TV with the small ZX-81 or T/S-1000 microcomputers could fit in a small briefcase and even include a mini-cassette recorder or micro-disk drive, RS-232 interface, telephone modem and a micro-printer and still be entirely battery operated.

The idea is mind-boggling. New horizons would exist for almost any type of business that would have representatives away from the parent company, and, most important, rather than paying the 1700 to 1800 dollars for the so-called portable units that exist today, the price of the micro-package shouldn't be much more than \$600. The potential should be even further increased when the



Spectrum with its Micro-Drives is introduced. Think of it, 48K RAM with all of those peripherals and up to 800K disk storage.

#### U.S. SPECTRUM SALES

Sorry we haven't been able to bring any definite date when the Spectrum color computer will arrive in the U.S. or who will be marketing it.

The latest information is that the target date is sometime during the first quarter of 1983. For those of you who are unfamiliar with the Spectrum, it is already being sold in Europe and the projected price for a 16K machine in the U.S. is 199.95. A 48K machine will sell for around \$300. It has upper/lower case with the same screen display as the T/S-1000 and ZX-81. There is no FAST/SLOW mode as the screen acts as the TS/ZX computers do in the SLOW mode but with the speed of the FAST mode.

Micro-Drives with the capacity of 100K of data per disk are projected to sell for 89.95 each with the Spectrum being able to accommodate up to 8 of these drives. The machine will also hook up to a normal cassette recorder that will save or load programs at 6 times the speed of the TS/ZX computers.

#### PRINTER NEWS

Rick Barnett of the WGBB T/S Users' group called to inform me that he is starting a Discount Printer Company for the TS/ZX computers. A plain paper printer will be available for as little as 117.50. A printer interface will be available that will allow hook-up to almost any parallel printer. A full line of printers will be available at reduced prices. Brand names carried will be Epson, CITOH, OKidata, Axion, Seikosha, and Star Micronics.

They will also sell memory units from Memotech, Byte-Back, Jigsaw and Gladstone. Software will be available from Gladstone, Data-Assette, Mindware and Soft Sync. Software will include subjects such as education and language (Spanish).

If you join the Users' Group, you can receive the group literature and be eligible for the Discount Buying Service.

#### Contact:

SIMPLY SINCLAIR  
PO BOX 488  
WOODBIDGE, VA, 22194  
(703) 494-3659 \* 491-7242

#### RAMPACK RIBBON CONNECTOR

Tired of programs bombing because of the inefficient way the RAMPack attaches to the computer? DK'tronics sells a ribbon connector that isolates the pack from the computer for \$18.00. It is about 8 inches long. Order from:

DK'tronics  
23 Sussex Rd.  
Gorleston,  
Great Yarmouth,  
Norfolk, England

Visa, MC accepted.

#### FLOPPY DISK FOR THE TS/ZX

AERCO is offering a Floppy Disk Drive interface for the TS/ZX computers for \$179. It will support from 1 to 4 drives in either single or double density and uses an IBM format with the Disk Operating System in ROM and on board the interface board. It uses ribbon connectors and is claimed to be 1000 times as fast as a cassette based system.

They also sell 5.25" double density drives for \$189 each and 2 drive cables for \$69 and 4 drive

cables for \$79.

Besides the Disk Drive equipment they also offer the following:

STD BUS INTERFACE - \$99.00

CENTRONICS PRINTER  
INTERFACE complete with  
cable & software in ROM - \$119.00

DIRECT VIDEO MOD kit - \$15.00  
installed - \$25.00

WORD PROCESSOR  
machine language - \$15.00

For more information contact:

AERCO  
BOX 18093  
AUSTIN, TX, 78760/78093  
(512) 385-7405

#### TRS-80 TO ZX/TS

Do you have a TRS-80 MOD 1 or MOD 3? Cook Laboratories sells a device that allows the user to write programs on the TRS-80 in Sinclair BASIC and then transfer the program to the TS/ZX computer. The TransCoder 1 shuttles RAM to RAM dialogue back and forth between computers at machine language speed. It comes complete with hardware, software and manual and sells for \$500 and includes shipping. For more information contact:

Cook Laboratories, Inc.  
P.O. BOX 529  
Norwalk, CT, 06856  
(203) 853-3641

#### SUPPORTING VENDORS SWAMPED

Don't be suprised if your orders from any of the supporting companies takes over 30 days to fill. There is an industry-wide slowdown of order filling due to the tremendous demand for after-market TS/ZX products.

Timex themselves didn't anticipate the tremendous reaction

to the T/S-1000 and, as a result, many outlets have had their inventories exhausted. Every day we receive complaints from people who have ordered items over 30, 60 and even 90 days before, who have still not received shipments. We may be slow in getting our subscriptions out on time, but we firmly believe that in a few months you will be getting them a few weeks earlier.

There are over 2 million of these computers out there and this is just in the U.S.

#### SPEAK TO ME, TIMEX!

Want to hear your computer talk? Namal Associates introduces the Super Talker which includes a potential infinite programmable vocabulary with an on-board 568 common word dictionary. The device has a built in speaker and is simple to program. It costs just 99.95. For further info contact:

NAMAL ASSOCIATES  
25 GWYDIR ST.  
CAMBRIDGE, CB1 2LG  
ENGLAND  
(0223) 355404/TELEX 817445

#### SCREAM AT ME, TIMEX!

Talking not enough for you? How about sound effects? Make your own music, explosions, gun shots, drums, lasars, organs, bells, chords, insect chirps, etc. through 8 octaves. The ZON X-B1 sandwiches between the RAMPack and computer and sells for 49.95 (Visa/MC accepted). For further information, contact:

BI-PAK  
PO BOX 6  
Ware, Herts  
England  
phone 0920-3182

#### WORK FOR ME, TIMEX!

CONT. ON PAGE 9





## THE COMPUTER TUTOR DATA GRAPHS

Sorry I'm late Class. Too much of the holiday spirits, I guess. Boy does my head hurt. I wanted to wait till after the bell rang before I came in.

Did you all have a nice holiday?  
Ah, that's good.

Today we will discuss using the computer's graphics generator to produce chart type graphics that can help data be visualized such as sales or profits. Can anyone tell me what commands or functions in the BASIC language can be used to produce graphs on the screen?

Yes, the gentleman in the back?

That's right, the PRINT AT commands can accomplish this and he correctly states that the BAR-GEN program that was on the JUNE/82 cassette utilized this concept.

There is another way of PLOTting and UNPLOTting graphics. Can anyone tell me what that may be? Ahah, no hands this time. What else but the PLOT and UNPLOT commands. What does PLOT and UNPLOT do; yes, the gentleman in the back again?

No, it has nothing to do with planting a garden - nor does it have anything to do with grave-digging or digging in the ground at all, for

that matter. I thought two right answers in a row would be a little too much to expect.

PLOT allows the user to pick a portion of the screen that he or she wants a little white square to appear. UNPLOTing the same location would make that square disappear.

PRINT AT graphics take up 4 times as much room on the screen as PLOT/UNPLOT graphics but allow the user the option of choosing any of the Sinclair graphics characters to appear on the screen. The space taken on the screen is twice as high and twice as wide as the PLOT/UNPLOT graphics characters.

PLOT/UNPLOT graphics symbols are only square in shape but 4 times as many can appear on the screen, so a finer resolution can be achieved. ENTER the following program and RUN it:

```
10 FOR Y=0 TO 31
20 LET X=(1.5**Y)**.225
30 PRINT AT 21-X,Y; CHR$ 128
40.NEXT Y
```

This program uses the PRINT AT graphics capability to plot a parabolic curve on the screen along the X and Y axes. Now ENTER and RUN the following program:

```

10 FOR Y=0 TO 43
20 LET X=(1.5 ** Y)**.15
30 PLOT Y,X
40 NEXT Y

```

A similar curve is plotted with finer resolution. This method is much better suited for graphing purposes but how can we use it where we can input data and have the data represented in the curve of the graph?

The answer lies in converting the data items into the values to be plotted on the screen. First, let us examine what we have to work with - that is the PLOT co-ordinates of the screen. Turn to the section of your Owner's Manual that has the screen co-ordinates defined.

Let us say that we had 12 months of sales that we wanted to plot on the screen. The sales figures are as follows:

JANUARY	1752
FEBRUARY	1339
MARCH	2897
APRIL	4544
MAY	3317
JUNE	2914
JULY	3776
AUGUST	5221
SEPTEMBER	3890
OCTOBER	3542
NOVEMBER	4119
DECEMBER	3550

These sales figures pretty much represent proportions of many businesses as they reflect seasonal trends involving cold weather, vacations and holidays.

It would be easy to write a program to allow the input of these figures:

```

10 DIM S(12)
20 FOR N=1 TO 12
30 SCROLL
40 INPUT S(N)
50 PRINT N,S(N)
60 SCROLL
70 NEXT N

```

This program would allow the

input of all the above sales figures but the conversion of those figures into screen co-ordinates is a little more tricky.

The screen PLOT co-ordinates allow a maximum of 64 positions across the screen and 44 up and down. It is rare that any data would fall into these parameters exactly. We could use the 64 positions across to indicate the months and to format the limits of our sales but we have to have a method of making the sales automatically fall into our height parameters. This, believe it or not, is a relatively easy task. First let us write a routine that would automatically find the maximum sales value. Add the following lines to the previous program:

```

80 LET A=0
90 FOR N=1 TO 12
100 IF S(N)>A THEN LET A=S(N)
110 NEXT N

```

A simple routine that easily finds the maximum sales value. It is better to have this routine separate from the actual inputting of the sales figures because if you have a program that allows additional sales data to be added to or deleted from, the value of (A) may not represent the highest sales value. It therefore behooves the programmer to have this routine used after all the data has been correlated.

We now have found the upper limit of our sales graph. We still have to achieve a method of converting this data into legal co-ordinate screen positions. The following lines accomplish this:

```

120 PRINT AT 21,1:0; AT 1,1: A
200 FOR N=4 TO 48 STEP 4
310 LET Y=(S(N/4)/A)*43
220 FOR Z=2 TO Y
230 PLOT N/2,Z
240 NEXT Z
250 PRINT AT 21,N/2+1:N/4
260 NEXT N

```

RUN this program with the above monthly sales data and observe the bar graph chart on the screen.



Line 120 sets the maximum/minimum parameters and the routine from lines 200 to 260 prints the graphic bars. This routine along with the routine from lines 80 to 118 automatically takes the largest sales value which is assigned to the numeric variable <A> and proportions all of the rest of the sales data to it.

Other types of graphic routines exist, also. Eliminate the lines from 220 to 260 and insert the following:

```
230 PLOT N+2,Y
250 PRINT AT 21,N/2+1;N/4
260 NEXT N
270 STOP
```

If you ENTER GOTO 120, the previously entered data will remain intact, even though program lines have been changed or discarded. You should observe on the screen just the data points that correspond with the monthly sales figures. This, of course, is not as easy to visualize as the BAR graph that we first generated. We cannot easily see the direction that the sales take from month to month. We need a method of connecting these points so that they can be more easily visualized. Add the following lines to the existing program:

```
240 GOSUB 300
300 LET Z=(S(N/4+1)/A)*43
310 IF Z(Y THEN GOTO 400
320 LET X=Z-Y
330 FOR C=1 TO 3
340 PLOT N+C+2,Y+C*X/3
350 NEXT C
360 RETURN
400 LET X=Y-Z
410 FOR C=1 TO 3
420 PLOT N+C+2,Y-C*X/3
430 NEXT C
440 RETURN
```

Again, keep the variables intact by executing the command, GOTO 120. Now we see the direction the sales take from month to month with the extra plotted data points. These points are produced by the subroutines starting with line 300 and line 400.

The display ends without the 12th month's sales being charted. This is because one of the routines is searching for the sales data for the 13th month for a comparison, and of course, the 13th month doesn't exist in our data file. Just disregard the error for now.

The line 300 subroutine simply produces a series of 3 points of equal distance that connect the 2 main sales data points between a month's sales that are larger than the following month's sales and that following month's sales data point.

The line 400 subroutine does the same thing, but only if a month's sales are smaller than the following month's. In other words, we have achieved a method of connecting the points to make the graph more visual. But is this the ultimate effect?

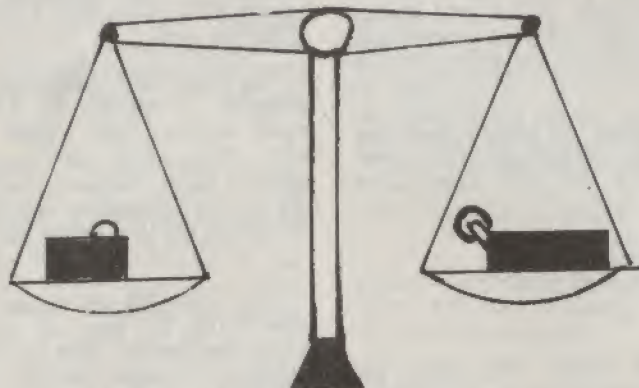
Add the following lines to the existing program:

```
345 GOSUB 500
425 GOSUB 600
500 FOR D=Y+((C-1)*X/3) TO
    Y+(C*X/3)
510 PLOT N+C+2,D
520 NEXT D
530 RETURN
600 FOR D=Y-((C-1)*X/3) TO
    Y-(C*X/3) STEP -1
610 PLOT N+C+2,D
620 NEXT D
630 RETURN
```

We now have the type of graph with appropriate peaks and valleys that we are used to seeing in the financial sections of our newspapers. You of course notice that the sales data points are plotted by the program before the connecting lines are plotted. To overcome this, reposition line 425 into line 415 so that the connecting line subroutine is executed before the sales data points are plotted. The same thing has to be done to reposition line 345 into line 335.

This program is a useful utility for any program where data must be

## PRINTER REVIEW



We have received two printers for the Sinclair computer, one from Sinclair and the other from Mindware.

### THE SINCLAIR PRINTER:

The first thing we noticed about this printer is its compact size. It is only about half the size of the computer but about twice as thick. It uses electro-static thermal paper that works on the following principle:

A normal ink-producing dot-matrix printer has a series of pins that strike the ribbon against the paper. The matrix element that comprises a printed character is a series of dots, where if all were used, would form a box. The most popular matrix is 5 dots across by 7 dots down. The pins are arranged in only the 7 down configuration in a movable device called a "dot matrix print head" or just - "head".

This head moves along the paper with the pins striking the ribbon in such a manner as to produce the desired characters.

A thermal printer uses the same concept but instead shoots a spark from the print head at the paper. The paper has metallic particles in

it and completes an electrical circuit that is started by the electrically charged print head.

The Sinclair printer works fine except for one problem. The paper won't feed properly. New lines may be printed over existing ones. This problem started occurring after about 50 lines were printed. I haven't tried making any adjustments yet so it might be something that can easily be overcome. In the meantime, I physically pull the paper each time I need a print-out. I have talked to other people who had received this printer and no one else had this problem, so I'm sure it's not common.

The printer easily hooks up to the computer by plugging directly into the back of the computer with the rampack, if used, completing the sandwich connection. It needs no power supply of its own but the power supply should provide at least one amp of current. Sinclair provides a one amp power supply with each unit.

If you do decide to order this printer, make sure to ask about extra rolls of paper. They are the only people I am aware of selling this printer and the paper.



## THE MINDWARE PRINTER

A very impressive unit almost the size of the computer and about twice as thick. This device prints on standard 1 3/4 inch adding machine tape with a micro-ink cartridge. This cartridge is the same type as used on the Sharp and Radio Shack pocket printing calculators. The Sharp part # is EA-800R. We don't have the Radio Shack part #.

Ed. Note - our thanks to Sheldon Weinburg of Brooklyn, NY for this information about the ribbons.

One of the things that bothered me about this printer was that it could only print 16 columns. I thought that the only way to get readable text such as a program listing was to print the left side of the program and then the right side and then paste the two sides next to each other. Although this is true, in many cases it is not necessary.

The computer has three print modes, where when mode (0) is used, the printer is instructed to print the first 16 characters of the line and then prints the second or remaining characters under the first line of printed characters and starts the process over again. Therefore the program:

```
10 LPRINT "ABCDEFGH IJKLMN PQR"
20 LPRINT "STUWXYZ0123456789"
```

would be listed as:

```
10 LPRINT "ABC
DEFGHIJKLMN PQR"
20 LPRINT "STU
WXYZ0123456789"
```

Perfectly readable and easily understood. The other 2 modes will allow the split printing and printing of just the first 16 characters of the lines whether it be a listing, using the COPY command or the LPRINT command.

The Mindware MW-100 printer also comes with its own power supply which is hooked up directly to the

printer and the computer power supply is left disconnected. The computer and printer both derive power from the MW-100 power supply as the current is back-fed into the computer.

Mindware is planning to sell these printers strictly through store outlets. It took a long time for them to receive FCC approval for this unit but I believe it is the best available for the price. It has the potential to print mailing labels and if coupled with an easily revised version of our CUSTOMER FILE program that appeared on the 10/82 cassette, one could easily cut the paper tape into labels and paste them on envelopes.

Both printers came after a 30 day wait and are or were available from:

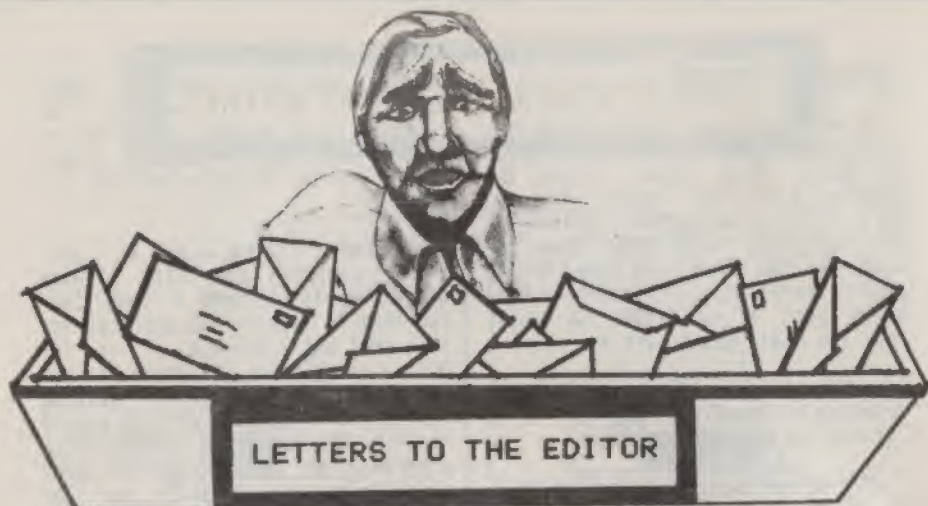
ZX-PRINTER - 99.95 - Gladstone Electronics, 1565 Kenmore Ave., Buffalo, NY, 14217, 1-800-833-8400

MW-100 PRINTER - 119.95 - Mindware Inc., 15 Tech Circle, Natick, MA, 01760, (617) 655-3388

## FACTS & FIGURES

According to the Bureau of Labor Statistics, there are more than 86 million Americans in the work force. It's also been estimated that nearly two-thirds of these workers are engaged in service activities such as communication, finance and insurance, wholesale and retail trade and government.

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Dear Ed,

A few days ago, I telephoned your office and received some helpful advice on how to get the 10/82 cassette working. It worked and I enjoyed it. The October tape, however, raised a problem in my mind which I have designated as problem #1.

I am also submitting for your consideration, problem #2. You and your computer may just be able to give me an answer. If this stretches your patience, just forget the whole deal.

I am looking forward to the December tape.

\*\*\*\*\*  
Problem #1 - Facts - Coincidence!

My daughter and I have the same birthday, August 2nd. What would a firm probability (not 50 - 50) be when the problem is further complicated by a father/daughter relationship. It would seem the odds would be tremendous. My daughter is 45 and I am 80. Is this a challenge?  
\*\*\*\*\*  
Problem #2

In the 1930s, my bank was held up by a man wanted badly by the FBI. His name was "Baby Face Nelson" who later became John Dillinger's right hand man.

At line-ups and in court, I did identify him and in the Wheaton, IL courtroom he was heard to say "I'll get that guy some day!".

On the same day, he was being taken in a cab from the Railroad Station in Joliet to the penitentiary, he pulled a gun, made the guard unlock his handcuffs and escaped. The following morning, the headline in the Chicago Tribune read, "BABY FACE NELSON ESCAPES!"

My question - What probability did I have (at 35 years of age) of ever reaching my present age, considering a killer like Nelson?

If you care to check, the above facts can be substantiated at the Itasca Historical Society or at the Chicago Tribune Morgue.

Raymond A. Franzen - Itasca, IL

Ed. note - Mr. Franzen is a retired attorney.

Dear Ray,

Thank you for the interesting piece of Americana. In answer to your first problem, I wouldn't know where to begin. Perhaps there is a logician among our readers who would be willing to take up the challenge.



Although I can't give you an answer to the second problem, perhaps I can give some clues as how to arrive at it. First of all, Mr. Nelson would have to be given a rating of some sort that would be proportional to the amount of threats he had made of this type as to opposed to how many he carried out successfully. A factor would then have to be arrived at as to how long it took him on the average from the point of making the threat to the point of its completion. This of course would have to be correlated with the odds of a successful escape while under penal supervision outside of a penal institution. Many other factors, I'm sure would come into play and knowing the lack of sophistication of law enforcement methods of that era as compared with today's, I would think it is safe to assume that no one, even a computer could hazard a guess that could come within 25% of the true picture.

If I were in your shoes, I would just be content that he went before you did.

Ed.

-----

Dear Ed.

I have just started receiving your magazine and enjoy it very much.

My problem is this - How do you change Apple programs with READ and DATA statements over to Sinclair BASIC?

Albert Clow - Waldo, KS

Dear Albert,

Funny you should ask! In our April/82 issue, which was our first one, the Old Professor wrote a 3 1/2 page tutorial dedicated to that subject. With the techniques explained in this article, a person should be able to take just about any BASIC program with READ, DATA and RESTORE commands and convert

them to Sinclair BASIC - and, most important, in most cases they will work easier and faster in Sinclair BASIC.

The secret involves putting all the DATA items into a string variable and using the (TO) function to search the variable for the data needed.

There are many techniques we show to accomplish all sorts of data manipulation. An example of these techniques is expressed in a program on the 6/82 cassette called "SCRAMBLED WORDS". In this program, there are 200 five-letter words in a data base. The program selects one at random and scrambles and then displays it on the screen. A 60-second clock appears on the screen and challenges the user to input the correct spelling of the word before the time runs out. If the spelling is correct, what ever time is left is added to the player's score and then the game is cycled to the next player. Each player gets 10 words and then the scores are totalled.

We hope some day to write a book showing all the tutorial articles written by the Old Professor because to my knowledge, no other publication or book dedicated to the Sinclair computers has ever had any of these techniques in them.

Ed. - P.S. - the April back issue package is still available.

-----  
Dear Ed.

I own a ZX-80 and have added the 8K ROM chip and the 16K RAM Pack. In general, I am delighted with the results. There is one matter I don't understand. I am unable to use any program that utilizes moving graphics. The Chess program works perfectly so I assume the hardware is OK. I have found that a line such as this:

```
100 IF INKEY$ = "" THEN GOTO 100
```

will not work on my computer. Changing the INKEY\$ to an INPUT helps but the screen blinks when keys are pressed. Otherwise the TV screen will not display. It seems that when the computer is actually calculating, it will not display on my screen.

Are these problems the result of my having a ZX-80 instead of a ZX-81? I thought that the 8K ROM chip was the only difference. What can I do to make my ZX-80 run these types of programs?

Steve Metz - Jacksonville, FL

Dear Steve,

Sad but true, the 8K ROM in a ZX-80 will not give true ZX-81 performance. Sinclair's marketing division did not make the public aware that when purchasing these ROMs, these problems would occur.

INKEY\$, when used as you stated will always have that effect. The key functions FAST and SLOW have no effect on the ZX-80 but when SLOW is used on the ZX-81 or T/S-1000, all screen flickering stops and screen graphics remain even while the machine is calculating. The only salvation the ZX-80 owner has is to introduce the PAUSE command at strategic locations of the program. To the unskilled programmer, this can be a frustrating ordeal.

Rules of Thumb when converting a program to run on a converted ZX-80 are:

- use INPUT instead of INKEY\$ whenever possible
- add lines to the program with the PAUSE command whenever needed to display screen graphics, particularly moving graphics.

The proper time to use PAUSE is whenever a PRINT, PLOT or UNPLOT statement is used in a FOR/NEXT loop, in a calculating routine or in any routine that has a line that includes PRINT, PLOT or UNPLOT in

it. The PAUSE statement should be in the next line following and should be followed by a number of no less than 50, such as the following program:

```
100 FOR N=10 TO 20
110 PRINT AT 10,N;" *"
120 PAUSE 50
130 NEXT N
```

RUN this program, Steve, and then try it without line 120. For those of you with ZX-81/TS-1000 computers, RUN this program normally and then put your computer in the FAST mode and do what I told Steve to do; you'll see the type of problems he is having. Try running some of your other programs in the FAST mode and convert them with the PAUSE command. I'm sure you're glad you don't have a converted ZX-80.

Another alternative is to buy one of the flicker-free graphics packages if you can find one. Micro-Ace used to sell them but I don't think they're in business any more.

Of course you could always get a ZX T/S-1000 and use your RAMpack. Many places are selling them for under \$90.

Sorry Steve, but that's about the best I can do. Good luck!

Ed.

TUTOR CONT.

graphed. As it stands, not many more than 12 data entries can be made - maybe 15 at most. The program can be modified to allow as many as 64 data entries which is what your homework assignment is.

WHAT DO YOU MEAN, NO HOMEWORK FOR THE HOLIDAYS!

Oh, you brought me a present? How nice, to think of the old Professor. Well, OK, I guess I can find a little more holiday spirit in me - Class dismissed.